

AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
April 28, 2009
HISTORY RECORD

FAA Control # 09-01-282

Subject: Glide Slope Intercept Altitudes on ILS Parallel Approaches

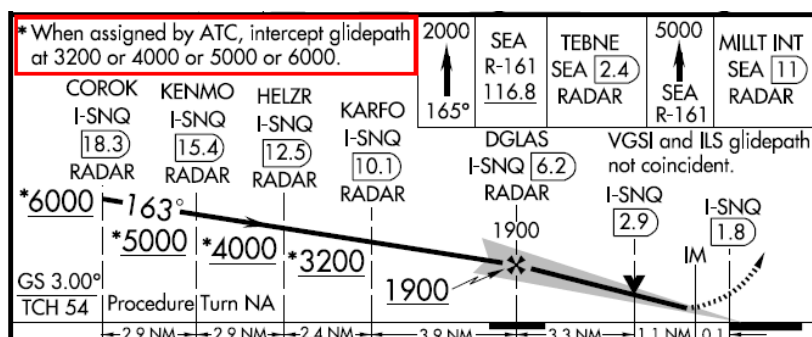
Background/Discussion: AIM 5-4-5, Instrument Approach Procedures, paragraph b (1) thru (4) provides guidance concerning depicted altitudes on US government instrument approach procedure charts:

1. Minimum altitude will be depicted with the altitude value underscored. Aircraft are required to maintain altitude at or above the depicted value, e.g., 3000.
2. Maximum altitude will be depicted with the altitude value overscored. Aircraft are required to maintain altitude at or below the depicted value, e.g., 4000.
3. Mandatory altitude will be depicted with the altitude value both underscored and overscored. Aircraft are required to maintain altitude at the depicted value, e.g., 5000.
4. Recommended altitude will be depicted with no overscore or underscore. These altitudes are depicted for descent planning, e.g., 6000.

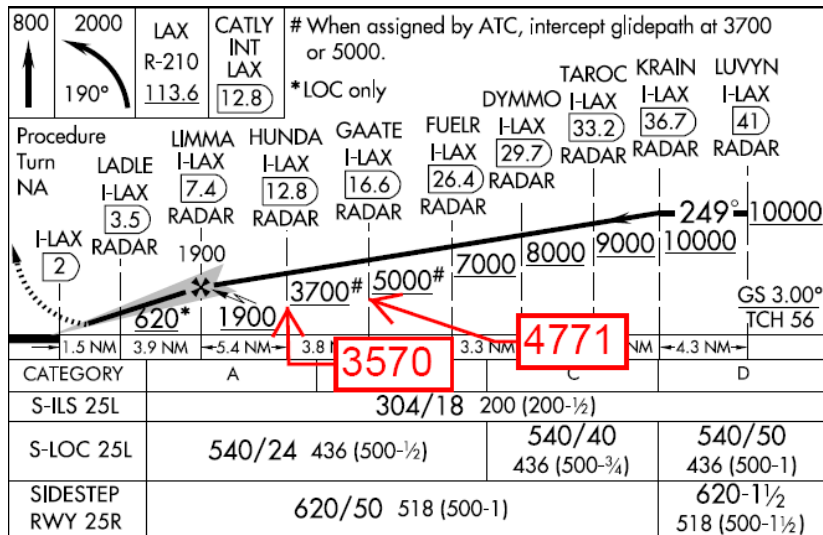
NOTE—

Pilots are cautioned to adhere to altitudes as prescribed because, in certain instances, they may be used as the basis for vertical separation of aircraft by ATC. When a depicted altitude is specified in the ATC clearance, that altitude becomes mandatory as defined above

Frequently, a note is placed in the profile view of the ILS approach procedure chart for a runway where simultaneous, parallel ILS operations are conducted advising the pilot that following assignment by ATC, they should intercept the glidepath at an altitude above the published glide slope intercept altitude, as depicted in this example:

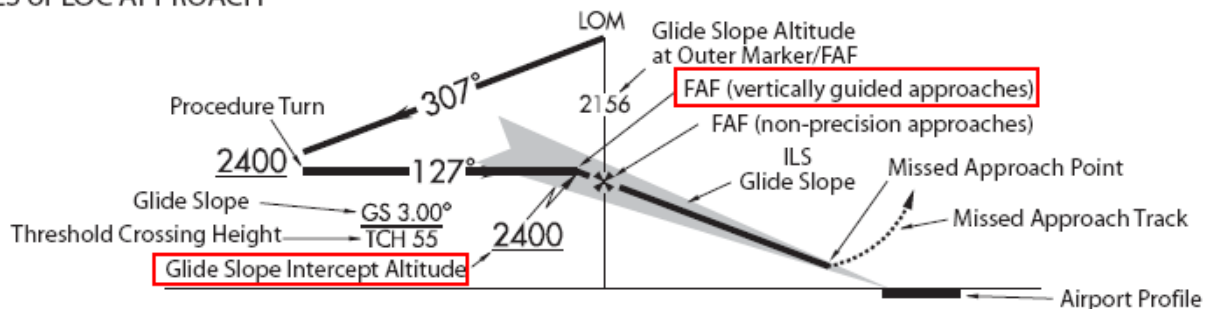


The note advises the pilot to intercept the glidepath, but fails to address the applicability of the published step-down fix minimum altitudes that are encountered during the subsequent descent. Interception of the glidepath (ILS glide slope) does not necessarily ensure that subsequent step-down fixes will be crossed at or above the published minimum crossing altitude, which is an expectation that is stated in AIM 5-4-5 (b)(1). An example of this situation may be seen on the ILS 25L at Los Angeles, CA (LAX) which is depicted below. The estimated ILS glide slope MSL crossing altitudes depicted by red boxes:



NBAA is concerned that lacking sufficient guidance on the instrument procedure chart and in the AIM, the pilot may cease tracking of the glidepath if he/she perceives that the aircraft will descend below the published step-down fix minimum altitude. This may result in not achieving the required altitude separation expected by ATC during simultaneous ILS approach operations. NBAA is also concerned about a pilot's understanding of the implications of an ATC assignment to intercept glidepath at an altitude other than the glide slope interception altitude as noted on the IAP and how this relates to the final approach fix location. The "lighting bolt" symbol depicted on US Government charts provides two critical pieces of information to the pilot.

ILS or LOC APPROACH



First, the "lighting bolt" depicts the glide slope intercept altitude and the precise final approach fix (PFAF), which is the point where the aircraft enters the final approach segment as defined by US TERPS and established for the particular ILS instrument approach procedure by 14 CFR Part 97.

Second, it defines the beginning of the final approach segment where the weather minimums established by 14 CFR 121.651 and 14 CFR 135.225 must be met for the pilot to continue the approach to landing.

It must be understood that even though the glidepath was intercepted above to the depicted glide slope intercept altitude, the PFAF remains fixed at the published glide slope intercept altitude in accordance with Part 97. Further, even if the pilot is cleared by ATC to intercept the glidepath early, the requirements of 121.651 and 135.225 are **not** triggered until aircraft reaches the glide slope intercept altitude, i.e., reaching the PFAF, as published on the instrument approach procedure.

Finally, NBAA is concerned about the need to publish each altitude where ATC may authorize a pilot to intercept the glidepath. We feel that this needlessly clutters the chart profile view. We question whether it is necessary to identify each step-down crossing altitude where ATC may assign a clearance to intercept and track the glidepath. Please see attached examples for LAX ILS 25L and SEA ILS 16L approaches

Recommendations: To reduce the chart clutter and to clearly state the applicability of published step-down fix altitudes encountered after the glidepath has been intercepted as instructed by ATC, NBAA suggests the following:

- Revise the note to clearly state the applicability of subsequent step-down fix altitudes when the glidepath is intercepted prior to the published glide slope intercept altitudes as follows:

“When assigned by ATC, intercept and track glidepath. Disregard subsequent step-down altitudes.”

To provide pilots with further guidance on the ATC’s request for an early glidepath intercept and tracking and to clearly identify the PFAF, NBAA suggests the following AIM revision:

- Add following note to 5-4-5-b

NOTE–

When noted on the instrument approach procedure, ATC may assign an aircraft to intercept and track the glidepath prior to the depicted glide slope intercept altitude. When assigned by ATC, pilots are expected to intercept and track the glide slope and disregard minimum, maximum, and mandatory altitudes depicted for subsequent step-down fixes. However, the final approach fix and the beginning of the final approach segment remain located at the published glide slope intercept altitude as depicted by the “lighting bolt” symbol on US Government charts.

Comments: This recommendation affects FAA Order 8260.19D, Interagency Air Cartographic Committee (IACC) specifications, the Aeronautical Information Manual, and the Instrument Flying Handbook.

Submitted by: Richard J. Boll II

Organization: NBAA

Phone: 316-655-8856

E-mail: Richard.boll@sbcglobal.net

Date: April 6, 2009

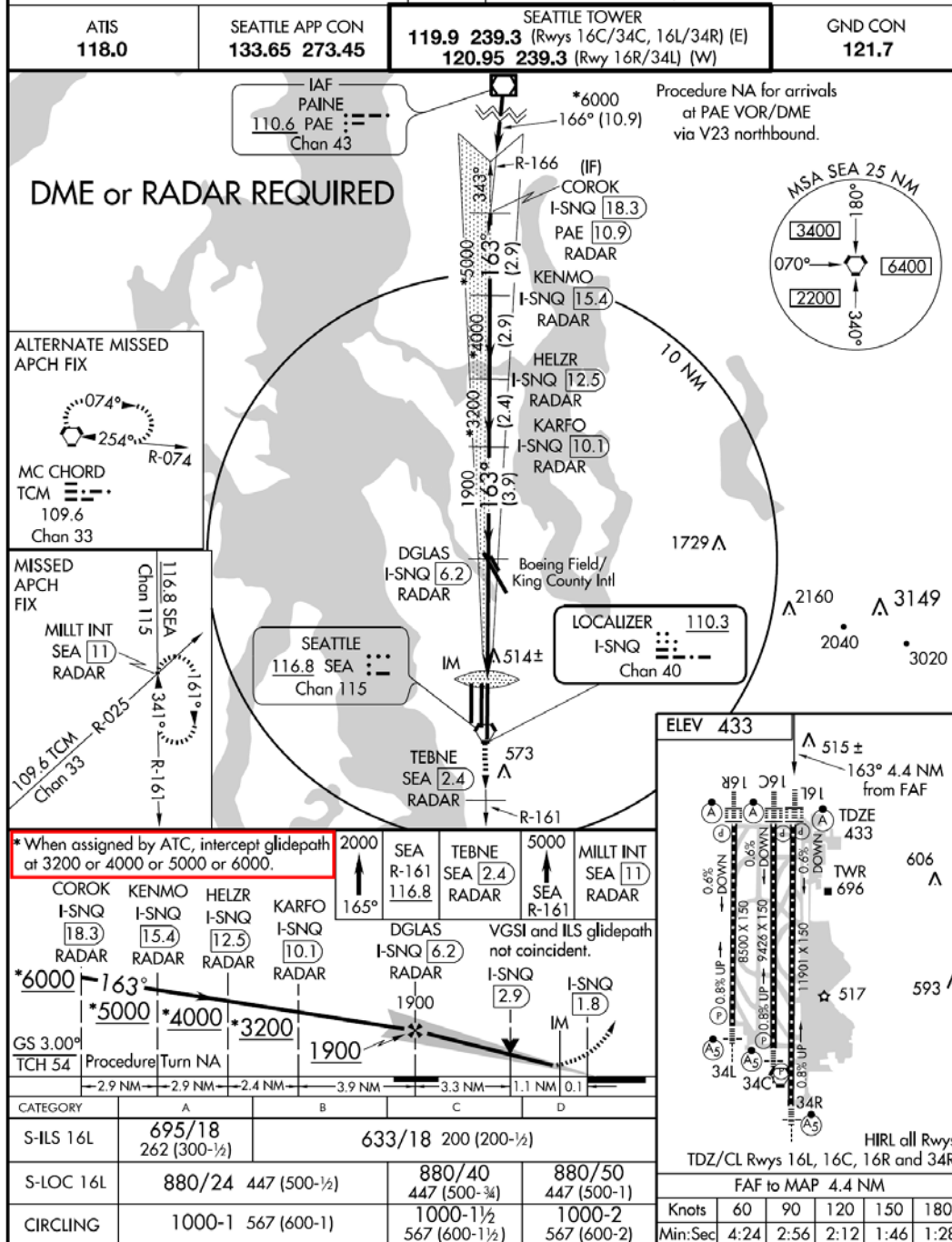
SEATTLE, WASHINGTON

AL-582 (FAA)

LOC/DME I-SNQ 110.3 Chan 40	APP CRS 163°	Rwy Idg 11901 TDZE 433 Apt Elev 433
--	------------------------	--

ILS or LOC RWY 16L SEATTLE-TACOMA INTL (SEA)

ATIS 118.0	SEATTLE APP CON 133.65 273.45	SEATTLE TOWER 119.9 239.3 (Rwys 16C/34C, 16L/34R) (E) 120.95 239.3 (Rwy 16R/34L) (W)	GND CON 121.7
-----------------------------	--	---	--------------------------------



NW-1, 12 MAR 2009 to 09 APR 2009

NW-1, 12 MAR 2009 to 09 APR 2009

SEATTLE, WASHINGTON

Amdt 4 09071

47°27'N-122°19'W

SEATTLE-TACOMA INTL (SEA) ILS or LOC RWY 16L

LOS ANGELES, CALIFORNIA

AL-237 (FAA)

LOC/DME I-LAX 109.9 Chan 36	APP CRS 249°	Rwy Idg 25L 11095 TDZE 104 Apt Elev 126	Rwy Idg 25R 11134 TDZE 102 Apt Elev 126
---	------------------------	--	--

ILS or LOC RWY 25L
LOS ANGELES INTL (LAX)

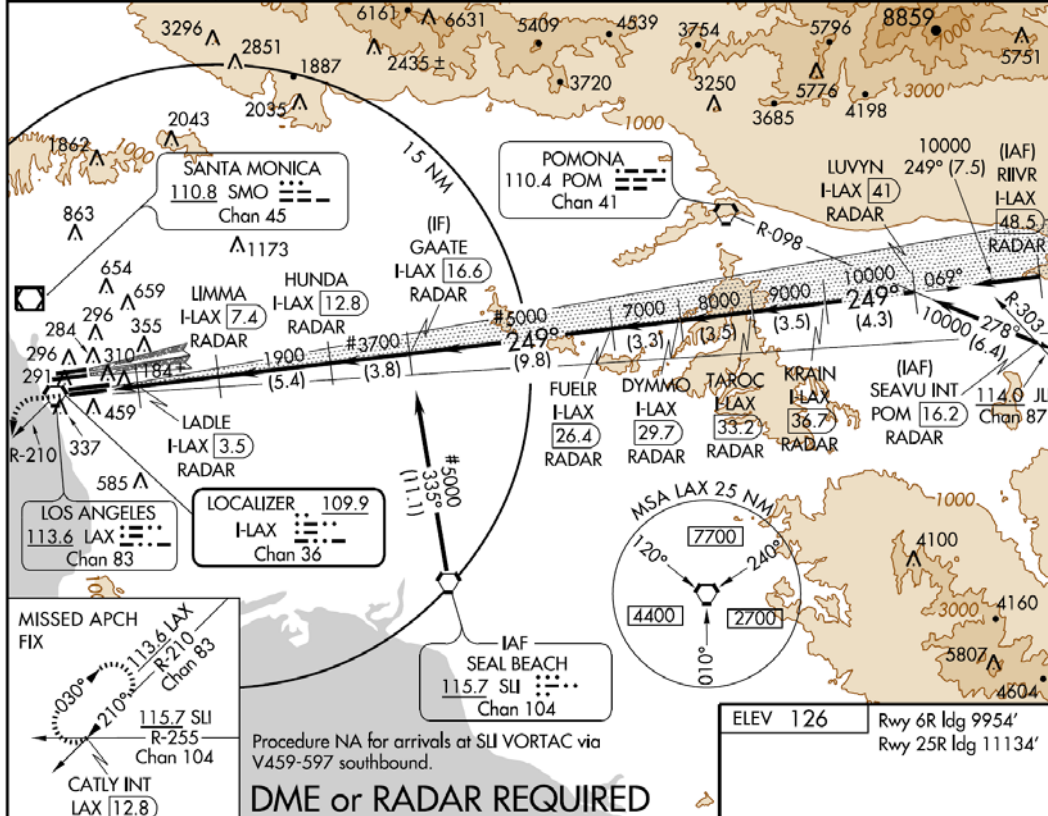
T Inoperative table does not apply to Sidestep Rwy 25R/Cats. A and B.
Simultaneous approach authorized with Rwy 24L/R.
LOC procedure NA during simultaneous operations.

ALSF-2
Rwy 25L

MALSR
Rwy 25R

MISSED APPROACH: Climb to 800 then climbing left turn to 2000 via heading 190° and LAX VORTAC R-210 to CATLY INT/LAX 12.8 DME and hold.

ATIS ARR 133.8 DEP 135.65	SOCAL APP CON 124.5 381.6	LOS ANGELES TOWER N 133.9 239.3 S 120.95 379.1	GND CON N 121.65 327.0 S 121.75 327.0	CLNC DEL 121.4 327.0
---	-------------------------------------	--	---	--------------------------------



SW-3, 12 MAR 2009 to 09 APR 2009

SW-3, 12 MAR 2009 to 09 APR 2009

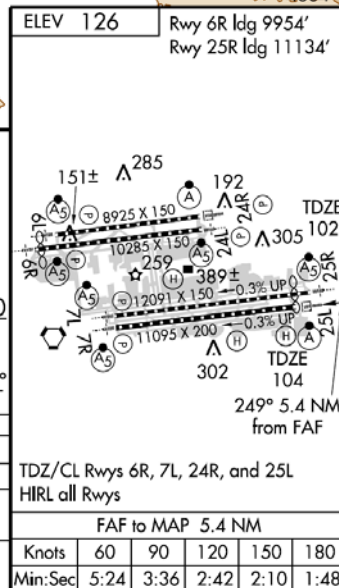
800 2000
190°
LAX R-210 113.6
CATLY INT LAX 12.8
When assigned by ATC, intercept glidepath at 3700 or 5000.
*LOC only

Procedure
Turn NA
LADLE I-LAX 3.5 RADAR
LIMMA I-LAX 7.4 RADAR
HUNDA I-LAX 12.8 RADAR
GAATE I-LAX 16.6 RADAR
FUELR I-LAX 26.4 RADAR
I-LAX 29.7 RADAR
TAROC I-LAX 33.2 RADAR
KRAIN I-LAX 36.7 RADAR
LUVYN I-LAX 41 RADAR

I-LAX 2
1900
620*
3700#
5000#
7000
8000
9000
10000
249°
10000
GS 3.00
TCH 56

1.5 NM 3.9 NM 5.4 NM 3.8 NM 9.8 NM 3.3 NM 3.5 NM 3.5 NM 4.3 NM

CATEGORY	A	B	C	D
S-ILS 25L	304/18 200 (200-1/2)			
S-LOC 25L	540/24 436 (500-1/2)		540/40 436 (500-3/4)	540/50 436 (500-1)
SIDESTEP RWY 25R	620/50 518 (500-1)			620-1 1/2 518 (500-1 1/2)



LOS ANGELES, CALIFORNIA

Amdt 11 08269

33°57'N-118°24'W

LOS ANGELES INTL (LAX)

ILS or LOC RWY 25L

Initial Discussion - Meeting 09-01: New issue presented by Rich Boll, NBAA. The issue expresses three concerns relating to publishing multiple glide slope intercept altitudes to accommodate simultaneous parallel operations: 1) Chart clutter, 2) the applicability of adhering to minimum altitudes after glide slope intercept, and 3) the definition of the “beginning of the final approach” as it applies to 14 CFR Parts 121.651 and 135.225. Valerie Watson, AJW-352, asked why pilots are not aware that published minimum altitudes are not applicable when flying a precision approach. James Taylor, AFFSA, responded it is because AIM guidance is not explicit. Tom Schneider, AFS-420 added that it also depends how far the glide slope is evaluated. Brad Rush, NFPO, stated that the procedure is evaluated and the glide slope flight inspected to the highest requested intercept altitude/distance. The NBAA recommendation document suggests the current note for these procedures be amended to read “When assigned by ATC, intercept and track glidepath. Disregard subsequent step-down altitudes.” The second part of the note created much discussion, after which the consensus was that the second part of the note is not necessary. Bruce McGray, AFS-410, stated that many approaches are becoming far too complex and controllers are too busy to provide complete monitoring. For example, there were 3 deviations in 12 minutes associated with a mandatory altitude on an ILS approach at Teterborough. (*Editor’s Note: the Teterboro approach example does not apply to this issue as only one intercept altitude is published. It is a better example for issue 09-01-283*). Mike Frank, AJT-22 stated that the notes should be standardized as they are not consistent. He added that all stepdown altitudes after glide slope intercept should be below the glide slope. Tom Schneider, AFS-420, responded that all the stepdown fixes and associated altitudes for the Localizer on the KLAX approaches were calculated to be at the ATC assigned altitude glideslope intercept point. He further stated that Order 8260.19 specifies verbiage for the note and that inconsistencies between charts may be because some older IAPs have not been brought up to the current standard. Kevin Comstock, ALPA, stated that the note is needed. He added that an informal ALPA survey indicated that most pilots believe that once established on the glide slope from the ATC assigned intercept altitude, they are on “the final approach segment”. As a result of the discussion and group consensus, Tom agreed to take an IOU to revise the note in Order 8260.19 to read “When assigned by ATC, intercept and track glidepath”. The NBAA recommended expanded AIM guidance for paragraph 5-4-5b will be forwarded to AFS-410 for consideration. **ACTION: AFS-410 and AFS-420**

Meeting 09-02:

Editor’s Note: *This issue and 09-01-283 were discussed simultaneously. The minutes are written to reflect and clarify pertinent points regarding each issue. This issue relates primarily to ILS approaches with multiple glide slope intercept altitudes specified to support close simultaneous operations.*

Tom Schneider, AFS-420, briefed that, as recommended at the last ACF-IPG meeting, guidance to revise the chart note for multiple glide slope (GS) intercept altitudes was included in Change 3 to Order 8260.19 under paragraph 852f(1) - see below, change in red text:

“.....If more than one GS/GP intercept altitude is necessary to support ATC operations, the GS/GP intercept point closest to the threshold is the PFAF and the additional intercept altitudes will be specified in a profile view note. Document the additional glidepath intercept information in the Notes block as follows:

“Chart profile note: *When assigned by ATC, intercept and track glidepath.”

Brad Rush, AJW-372, stated that this issue was also a topic of discussion at the PARC the previous week. The PARC is looking at reducing separation between runway centerlines and perhaps reducing the vertical separation between glide slope intercept altitudes to save fuel. Gary Fiske, AJT-28 asked whether glide slope intercept altitudes were temperature corrected. The answer is no. Bruce McGray, AFS-410, suggested that on ILS approaches with multiple GS intercept altitudes, perhaps the ILS "feather" should be extended to the highest altitude intercept point. Additionally, Bruce suggested ATC phraseology should include "fly glideslope" with the approach clearance indicating that stepdown altitude restrictions after glide slope intercept are not applicable. This suggestion was not well received. Rich Boll, NBAA, noted that the original recommendation document requested the addition of a note to AIM paragraph 5-4-5-b to clarify early glidepath intercept procedures and PFAF identification. He requested this addition be given consideration by AFS-410. The group consensus is that the issue may be closed when the AIM is updated. **ACTION: AFS-410.**

MEETING 10-01: Bruce McGray, AFS-410, briefed that his office has discussed the issue and believes the AIM language should be more comprehensive and has edited NBAA's recommendations for the note following 5-4-5b to read (changes shown in red):

***NOTE:** When multiple glidepath intercept altitudes are authorized to support ATC simultaneous operations, the glidepath intercept point closest to the threshold is the precise final approach fix (PFAF) and the additional intercept altitudes are specified in a profile view note on US government charts. When assigned one of these annotated altitudes by ATC and subsequently cleared for the instrument approach procedure, pilots are expected to intercept and track the glide slope and disregard minimum, maximum, and mandatory altitudes depicted for subsequent step-down fixes. However, the PFAF and the beginning of the final approach segment remain located at the published glide slope intercept altitude as depicted by the "lightning bolt" symbol on US Government charts.*


Tom Schneider, AFS-460, briefed that Order 8260.19D was revised on October 22, 2009 to change the profile note at ATC assigned intercept altitudes on ILS approaches with multiple GS intercept altitudes to read "When assigned by ATC, intercept and track glidepath." Mike Frank, AJT-28, stated that this was a false premise. The intermediate altitudes on the ILS approaches at Los Angeles Int'l (LAX) are for ATC operational separation; flying the glide slope could violate separation standards unless the underlying step-down altitudes were temperature corrected. He added that there were no problems until the fixes with the associated step-down altitudes were re-located during the last procedure amendments. Brad Rush stated that temperature correcting the intermediate altitudes could create other separation related problems at LAX. He added that the new GS altitude formulae would be used at the next procedure revision. Tom asked when that would occur and Brad responded the ILS RWY 24 and 25 approaches were on the production schedule for the May 5, 2011 chart date and agreed to keep the group apprised of the status of the amendments. Tom Loney, CAF, asked what procedures did ATC expect when cleared for an ILS approach at other than the PFAF altitude. Gary Fiske, AJT-28, responded that ATC expected the pilot to comply with intermediate altitude restrictions. This created a lively discussion with several pilot groups all agreeing that this is not what the note or approach clearance implies. They unanimously stated that in that case, the note and ILS approach clearance was of no value unless they could track the GS. The bottom line as expressed by Rich Boll, NBAA, is "a pilot simply wants to know when it is acceptable to track the glide slope after being cleared for an ILS approach". Bruce McGray, AFS-410, agreed that this makes a much more complicated procedure on the part of the aircrew to accommodate ATC. Tom Schneider closed the discussion by stating that the proposed AIM recommendation

and 8260.19 guidance is of no value unless all simultaneous ILS approaches with underlying step-down altitudes are temperature corrected. **ACTION: AFS-410 and AJW-372.**

Editor's Note: *Following the above discussion, Bruce McGray, AFS-410, presented a sidebar briefing on an initiative currently under consideration by AFS-410. The Branch is proposing to establish a web site where pilots can pre-review known procedural problem areas like the known hard altitude restrictions at Teterboro and Orlando Executive and the ILS approaches at LAX. The concept is that this type "heads up" alert will enable pilots to avoid problems. Mike Frank, AJT-28 recommended that the concept should probably be coordinated through General Counsel. Both Rich Boll, NBAA, and Hal Becker, AOPA, expressed support of the concept. Roy Maxwell, Delta, stated that the concept is a band-aid approach vice fixing the problems.*

MEETING 10-02: Brad Rush, AJV-3B, briefed that the amendments to revise the stepdown fix locations for the LAX ILS RWY 24L/R and 25L/R approaches are scheduled for the May 5 chart cycle. The changes will ensure that aircraft tracking the ILS glide slope are above the intermediate stepdown fix altitudes. As simultaneous parallel approaches are amended at other airports the new formulae will be applied to those procedures. Rich Boll, NBAA, asked whether this means that aircraft, when cleared for ILS approaches with multiple specified GS intercept altitudes, can track the glide slope and disregard intermediate stepdown fix altitudes. Bill Hammett, AFS-420 (ISI) briefed that the AIM change agreed to at the last meeting had been forwarded for publication on March 10, 2011. This change supports Rich's position. Mike Frank, AFS-52, stated that when cleared for an ILS approach, the pilot still must adhere to specified fix crossing altitudes prior to the PFAF. This position was supported by Gary Fiske, AJT-28. Tom Schneider, AFS-420, stated that procedures with a note authorizing multiple glide slope intercept altitudes are applicable only at locations that permit simultaneous parallel operations. Tom added that the requirement for multiple glide slope intercept altitudes may go away if/when an AFS-450 study (currently in progress) to assess the necessity for vertical guidance when conducting simultaneous operations is completed. Larry Wiseman, AOV-310, asked whether it was the ATO's position to disrupt stabilized descents. Mike responded yes, and emphasized that the stepdown altitudes were for ATC separation purposes and even when the fixes/altitudes were temperature corrected, pilots will be expected to comply with stepdown fix altitudes outside the PFAF. Rich stated that if this is true, then the note requirement on the chart is misleading. He stated that nearly all pilots when cleared for the ILS approach at an altitude annotated on the chart "*when assigned by ATC, intercept glidepath at (altitude)*" are going to intercept and track the glidepath from that altitude to the runway. If the ATC intent is that the stepdown profile is always to be followed, the plan view notes need to be eliminated and the procedures noted in issue 09-01-283 be followed for all ILS approaches. Rich recommended the current chart notes be NOTAMed until the issue resolved. Mark Ingram, ALPA, stated that perhaps the term "vertical path" should be used vice glidepath. Tom Loney, CAF, agreed. Bill Hammett re-capped the current proposed AIM changes with the recommendation that the proposed change under this issue be held pending further discussion. The group agreed and also recommended that an ad hoc group needs to be formed to determine exactly what notation is required on approach charts that support simultaneous operations. Tom Schneider accepted the IOU to check the status of the aforementioned AFS-450 study and recommended no group be formed until the results were in. Mike Frank, AFS-52, stated that temperature correcting all intermediate stepdown altitudes on simultaneous approaches will provide the most effective solution and asked Brad whether this could be given priority. Brad responded that priorities are set through the RAPT and NAPT. Brad also agreed to provide Rich a listing of all simultaneous approaches, which Rich will use to initiate RAPT action. Four IOUs were assigned: 1) AFS-410 to hold the AIM change recommended under

this issue; 2) AFS-420 to ascertain the status of the AFS-450 vertical guidance for simultaneous approaches study; 3) Brad Rush to provide NBAA a listing of simultaneous approaches; and 4) Rich Boll to pursue RAPT action to get priority for simultaneous approach procedure amendments. **ACTION: AFS-410, AFS-420, AJV-3B, and NBAA.**

MEETING 11-01: Bill Hammett, AFS-420 (ISI), briefed that AFS-450 estimates that the results of the study to determine whether vertical guidance is required for close simultaneous operations will be available July 15, 2011. Brad Rush, AJV-3B, advised that he had provided Rich Boll, NBAA, a listing of the locations that had simultaneous approach operations. Rich, in turn, began coordinating procedure amendments through the applicable RAPTs to alleviate the altitude deviations. The Chair of the Great Lakes RAPT advised that the "track glideslope" issue was being addressed by the NAP. Brad added that when his organization attempted to temperature correct the fixes on the LAX approaches, they were advised to keep the fixes exactly as currently located with the requested minimum crossing altitudes. Bruce McGray, AFS-410, briefed that the current note in the simultaneous ILS approach profiles will be removed. The AIM guidance published under issue 09-01-283 mandates that pilots fly the approach vertical profile as published. He added that an AFS Information For Operators (InFO) emphasizing this fact was published on March 28, 2011. A copy of the InFO is included here . Ted Thompson, Jeppesen, commented about the impact on chart production and asked for the time frame and number of charts to be amended. Brad responded that the note will be eliminated via P-NOTAMs, hopefully over the next 6-months. Rich emphasized that with the summer season and hot weather approaching, the notes should be deleted ASAP to preclude further pilot deviations. Brad added that simultaneous approach policy needs to be removed from Order 8260.3 (TERPS). Rick Dunham, AFS-420, responded that his Branch agrees and this recommendation is already being addressed through the US-IFPP. In the interim, AFS-420 will revise Order 8260.19 to remove the requirement for the "intercept and track glideslope" note.

ACTION: AFS-410 and AJV-3B.
